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NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC)
GUIDELINE SYNTHESIS

SKIN CANCER
PART I. SCREENING AND PREVENTION

Guidelines

- Scottish Intercollegiate Guidelines Network (SIGN). Cutaneous melanoma. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2003 Jul. 50 p. (SIGN publication; no. 72). [277 references]
- U.S. Preventive Services Task Force (USPSTF):
  - Counseling to prevent skin cancer: recommendations and rationale. MMWR Recomm Rep 2003 Oct 17;52(RR-15):13-7. [27 references]
  - Screening for skin cancer: recommendations and rationale. Am J Prev Med 2001 Apr;20(3 Suppl):44-6. [9 references]

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INTRODUCTION:

A direct comparison of the Scottish Intercollegiate Guidelines Network (SIGN) and the U.S. Preventive Services Task Force (USPSTF) recommendations for skin cancer screening and prevention is provided in the tables below. The USPSTF recommendations include melanoma and non-melanoma skin cancer. The SIGN guideline focuses its skin cancer discussion on cutaneous melanoma, providing

recommendations on screening and prevention, as well as the diagnosis, management, and treatment of skin cancer. Recommendations concerning diagnosis, management, and treatment of this skin cancer are compared in Part II of this synthesis (currently under development).

Table 1 gives a broad overview of the three guidelines being compared in this synthesis. Table 2 details the recommendations for screening and prevention of skin cancer. Benefits and harms that relate to the major recommendations are listed in Table 3. The supporting evidence is classified and identified with selected major recommendations for SIGN and USPSTF. The definitions of their rating schemes are included in Table 4.

Following the content and recommendation comparison tables, the areas of agreement and differences among the guidelines are identified.

Related Guidelines

- Centers for Disease Control and Prevention. Guidelines for school programs to prevent skin cancer. MMWR Recomm Rep 2002 Apr 26;51(RR-4):1-18. [145 references]
- Task Force on Community Preventive Services. Preventing skin cancer: findings of the Task Force on Community Preventive Services on Reducing Exposure to Ultraviolet Light. MMWR Recomm Rep 2003 Oct 17;52(RR-15):1-12. [28 references]

Abbreviations

- SIGN, Scottish Intercollegiate Guidelines Network
- SPF, Sun protection factor
- USPSTF, U.S. Preventive Services Task Force
- UV, Ultraviolet

TABLE 1: COMPARISON OF SCOPE AND CONTENT	
OBJECTIVE AND SCOPE	
SIGN (2003)	• To provide advice at all stages of the patient's pathway of care, from primary prevention to early recognition, treatment, and follow-up
USPSTF (2001 & 2003)	2001 • To summarize the current USPSTF recommendations for screening of skin cancer • To update the 1995 recommendation contained in the Guide to

	Clinical Preventive Services, Second Edition 2003 • To summarize the current USPSTF recommendations on counseling to prevent skin cancer and the supporting scientific evidence • To update the 1996 recommendation contained in the Guide to Clinical Preventive Services, Second Edition
Target Population	
SIGN (2003)	• Scotland • Individuals at risk for and/or diagnosed with cutaneous melanoma
USPSTF (2001 & 2003)	• United States • The general population, including adults and children, seen in primary care settings
Intended Users	
SIGN (2003)	Advanced Practice Nurses Allied Health Personnel Nurses Physician Assistants Physicians Public Health Departments
USPSTF (2001 & 2003)	Advanced Practice Nurses Allied Health Personnel Health Care Providers Nurses Physician Assistants Physicians
Interventions And Practices Considered	

SIGN (2003)	Prevention
	
	• Public education on the use of sun protective measures (e.g., sunscreen and clothing) and identification of risk factors
	  • Non-alarmist brochures and leaflets
	  • Interactive computer programmes (considered but not recommended)

	Screening (considered but not specifically recommended) Note: Recommendations for the diagnosis, management, and treatment of skin cancer are also provided. These are described and compared in Part II of this synthesis (currently under development).

USPSTF (2001 & 2003)	Prevention (2003)
	
	• Behavioral counseling regarding skin protection measures, including:
	  • Reducing sun exposure
	  • Wearing protective clothing
	  • Using sunscreen
	  • Avoiding sunlamps and tanning equipment
	  • Practicing skin-self examination
	
	Screening (2001)
	
	• Screening for skin cancer using a total-body skin examination

TABLE 2: RECOMMENDATIONS	
SCREENING RECOMMENDATIONS	
SIGN (2003)	No randomised controlled trials on mass screening were identified. Two American systematic reviews of screening for melanoma (and other skin cancers) have identified observational data to suggest that screening in high-risk groups might be effective. (Evidence level 2++) A formal programme of mass screening for melanoma in Scotland is not recommended. Although mass screening is not recommended, the following recommendation is offered with respect to "Delay in Diagnosis": D - Health professionals should be encouraged to examine patients' skin during other clinical examinations.
USPSTF (2003)	The evidence is insufficient to recommend for or against routinely screening for skin cancer using a total body skin examination for the early detection of cutaneous melanoma, basal cell cancer, or squamous cell skin cancer. I recommendation. Evidence is lacking that skin examination by clinicians is effective in reducing mortality or morbidity from skin cancer.

	Clinical Considerations • Benefits from screening are unproven, even in high-risk patients. • Clinicians should be aware that fair-skinned men and women over age 65, patients with atypical moles, and those with more than 50 moles constitute known groups at substantially increased risk for melanoma. • Clinicians should remain alert for skin lesions with malignant features noted in the context of physical examinations performed for other purposes. Asymmetry, border irregularity, color variability, diameter greater than 6 mm, or rapidly changing lesions are features associated with an increased risk of malignancy. Suspicious lesions should be biopsied. Note: The USPSTF did not examine the outcomes related to surveillance of patients with familial syndromes, such as familial atypical mole and melanoma syndrome.
PREVENTION RECOMMENDATIONS	
Preventive Counseling/Education	
SIGN (2003)	Public Education to Promote Primary Prevention: D - Brochures and leaflets should be used to deliver preventive information on melanoma to the general public. Leaflets, brochures, and educational packages can significantly influence increased short term user-knowledge of sun awareness measures and can assist in the early detection of melanoma. Insufficient evidence was identified to enable recommendations to be made about the style or content of leaflets and brochures. Education to Promote Early Detection: B - Healthcare professionals and members of the public should be aware of the risk factors for melanoma. C - Individuals identified as being at higher risk should be: • advised about appropriate methods of sun protection • educated about the diagnostic features of cutaneous melanoma
USPSTF (2003)	The USPSTF concludes that the evidence is insufficient to recommend for or against routine counseling by primary care clinicians to prevent skin cancer. I recommendation. The USPSTF found insufficient evidence to determine whether clinician counseling is effective in changing patient behaviors to reduce skin

	cancer risk. Counseling parents may increase the use of sunscreen for children, but there is little evidence to determine the effects of counseling on other preventive behaviors (such as wearing protective clothing, reducing excessive sun exposure, avoiding sun lamps/tanning beds, or practicing skin self-examination) and little evidence on potential harms.
Preventive Interventions	
SIGN (2003)	There is indirect evidence that sun avoidance and other sun-protective measures (e.g., clothing, hats and opaque sunscreens) are likely to reduce the risk of melanoma. Sunscreen effectiveness is difficult to demonstrate for a number of reasons (see the original guideline document for details). Given these potentially adverse effects of sunscreens in relation to risk of melanoma, physical protection measures should be regarded as more important than sunscreen use (Evidence level 2++). In the absence of evidence to support recommendations about specific aspects of protection measures in Scotland, the advice listed below is based on Australian guidelines on melanoma, interpreted in the light of the Scottish climate (Evidence level 4): • Use clothing as the primary means of protecting against the sun. • People of fair complexion should be especially careful about sun exposure. • Avoid using sun beds, tanning booths, and tanning lamps as an increased risk has been reported in some studies. • Use broad spectrum sunscreens with a minimum SPF of 15 as an adjunct to sun avoidance and other sun protective measures, providing this does not lead to increased time spent in the sun. • Avoid exposure to direct, intense sunlight, especially around midday (e.g., seek out shade). • Provide children with appropriate sun protection for outdoor activities.
USPSTF (2003)	• Using sunscreen has been shown to prevent squamous cell skin cancer. The evidence for the effect of sunscreen use in preventing melanoma, however, is mixed. Sunscreens that block both ultraviolet A (UV-A) and ultraviolet B (UV-B) light may be more effective in preventing squamous cell cancer and its precursors than those that block only UV-B light. However, people who use sunscreen alone could increase their risk for melanoma if they increase the time they spend in the sun. • UV exposure increases the risk for skin cancer among people with all skin types, but especially fair-skinned people. Those who sunburn readily and tan poorly, namely those with red or blond hair and fair skin that freckles or burns easily, are at highest risk

	for developing skin cancer and would benefit most from sun protection behaviors. The incidence of melanoma among whites is 20 times higher than it is among blacks; the incidence of melanoma among whites is about 4 times higher than it is among Hispanics. • Observational studies indicate that intermittent or intense sun exposure is a greater risk factor for melanoma than chronic exposure. These studies support the hypothesis that preventing sunburn, especially in childhood, may reduce the lifetime risk for melanoma. • Other measures for preventing skin cancer include avoiding direct exposure to midday sun (between the hours of 10:00 AM and 4:00 PM) to reduce exposure to UV rays and covering skin exposed to the sun (by wearing protective clothing such as broad-brimmed hats, long-sleeved shirts, long pants, and sunglasses). • The effects of sunlamps and tanning beds on the risk for melanoma are unclear due to limited study design and conflicting results from retrospective studies.
Skin Self Examination	
SIGN (2003)	C - Individuals identified as being at higher risk should be encouraged to perform self examination of the skin.
USPSTF (2003)	Only a single case-control study of skin self-examination has reported a lower risk for melanoma among patients who reported ever examining their skin over 5 years. Although results from this study suggest that skin self-examination may be effective in preventing skin cancer, these results are not definitive.

TABLE 3: BENEFITS AND HARMS	
BENEFITS	
SIGN (2003)	Improved prevention and early detection of melanoma
USPSTF (2001 & 2003)	Screening (2001) Screening consistently identifies melanomas that are, on average, thinner (i.e., at an earlier stage) than those found during usual care. It is not known if this stage shift leads to decreased morbidity or mortality. A case-control study in which skin self-examination was associated with a lower incidence of lethal melanoma provides indirect evidence that the shift to earlier stages found in screening

may be associated with better clinical outcomes. Evidence from studies of the consequences of delay in diagnosis is inconsistent.

Even without formal screening programs, mortality from basal cell and squamous cell carcinoma is low compared to mortality from melanoma, but early detection and treatment may reduce morbidity and disfigurement from these cancers. No studies were found that evaluated whether screening improves the outcomes of these cancers.

Subgroups Most Likely to Benefit

Elderly individuals

Counseling (2003)

Community and worksite educational interventions have demonstrated significantly increased use of skin protection measures, such as wearing hats and long-sleeve shirts and staying in the shade; however, evidence addressing the effectiveness of clinician counseling to prevent skin cancer is extremely limited. Most studies of counseling have examined intermediate outcomes such as knowledge and attitudes rather than changes in behavior. In a recent survey, 60% of pediatricians said that they usually or always counsel patients about skin protection, but advice to use sunscreen is more common than advice about wearing protective clothing or avoiding the midday sun.

Simple reminders and instructional materials for clinicians can overcome some of the barriers to regular counseling. A randomized trial of a community-based intervention involving 10 towns in New Hampshire suggests that office-based counseling by physicians may be an effective component of a multi-modal program to promote skin protection. The proportion of children with some sun protection increased in the intervention towns (from 78% to 87%) but not in control communities ($P = 0.029$). More parents reported receiving some sun protection information from a clinician in the intervention towns. However, most of the change was due to increased sunscreen use rather than to reduced sun exposure.

Subgroups Most Likely to Benefit

UV exposure increases the risk for skin cancer among people with all skin types, but especially fair-skinned people. Those who sunburn readily and tan poorly, namely those with red or blond hair and fair skin that freckles or burns easily, are at highest risk for developing skin cancer and would benefit most from sun protection behaviors. The incidence of melanoma among whites is 20 times higher than it is among blacks; the incidence of melanoma among whites is about 4 times higher than it is among Hispanics.

HARMS	
SIGN (2003)	Risks related to preventive strategies • Sunscreen use may be associated with greater sun exposure. • Some ingredients found in sunscreens may be carcinogenic. • Risks associated with sun avoidance, such as a lack of vitamin D
USPSTF (2001 & 2003)	Potential Adverse Effects of Screening (2001) There are no serious risks from total body skin examination but examination may be embarrassing to some patients and inconvenient in some settings. Screening could result in unnecessary treatment, either due to misdiagnosis or to detection of lesions that might not have caused clinical consequences. Screening also detects large numbers of benign skin conditions, which are very common in the elderly and could lead to additional biopsies and unnecessary or expensive procedures. Potential Harms of Skin Protection Behaviors (2003) There are limited data regarding potential harms of counseling or of specific skin protection behaviors. A possible result of skin cancer counseling that focuses on the use of sunscreen can lead to a false sense of security, which might lead to more time in the sun. For example, a randomized trial with young adults found that those who used sunscreen with a high SPF stayed longer in the sun than those who used sunscreen with a lower SPF. There has been some concern that use of a SPF of 15 results in vitamin D deficiency. However, a randomized trial in people over 40 years of age found that sunscreen use over the summer had no effect on 25-hydroxyvitamin D3 levels. Concerns related to sun avoidance include reduced physical activity levels among children and negative effects on mental health. However, no studies have evaluated the effects of sun protection behaviors on these outcomes.

TABLE 4: EVIDENCE AND RECOMMENDATION RATING SCHEMES	
SIGN (2003)	Grades of Recommendation A: At least one meta-analysis, systematic review of randomised controlled trials (RCTs), or RCT rated as 1++ and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+,

	directly applicable to the target population, and demonstrating overall consistency of results B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+ C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++ D: Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+ Levels of Evidence 1++: High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias 1+: Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias 1-: Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias 2++: High quality systematic reviews of case control or cohort studies; high quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal 2+: Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal 2-: Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal 3: Non-analytic studies (e.g. case reports, case series) 4: Expert opinion
USPSTF (2001 & 2003)	The Task Force grades its recommendations according to one of 5 classifications (A, B, C, D, I) reflecting the strength of evidence and

	magnitude of net benefit (benefits minus harms): A The USPSTF strongly recommends that clinicians provide [the service] to eligible patients. The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms. B The USPSTF recommends that clinicians provide [this service] to eligible patients. The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms. C The USPSTF makes no recommendation for or against routine provision of [the service]. The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation. D The USPSTF recommends against routinely providing [the service] to asymptomatic patients. The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits. I The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. Evidence that [the service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined. The USPSTF grades the quality of the overall evidence for a service on a 3-point scale (good, fair, poor): Good Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes. Fair Evidence is sufficient to determine effects on health outcomes, but

	the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes. Poor Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.

GUIDELINE CONTENT COMPARISON

The Scottish Intercollegiate Guidelines Network (SIGN) and the U.S. Preventive Services Task Force (USPSTF) present recommendations for skin cancer screening and prevention, and provide explicit reasoning behind their judgments. Both groups grade their recommendations and the supporting evidence.

The SIGN guideline focuses its skin cancer discussion on cutaneous melanoma, providing recommendations on screening and prevention, as well as the diagnosis, management, and treatment of skin cancer. The USPSTF recommendations also include nonmelanoma skin cancer. There are two distinct USPSTF guidelines, with one providing recommendations for screening and the other providing recommendations on preventive counseling interventions.

Recommendations concerning diagnosis, management, and treatment of skin cancer are compared in Part II of this synthesis (currently under development).

Public Health Departments are included as intended users of the SIGN guideline as opposed to the USPSTF guideline, which focuses on the primary care clinician-patient interaction.

Areas of Agreement

Routine Screening for Skin Cancer

Both SIGN and USPSTF are in general agreement that routine or mass screening for skin cancer using total body skin examination cannot be recommended for the general population. Both groups agree, however, that physicians should be aware of the risk factors for melanoma, and that they should remain alert for suspicious skin lesions when examining patients for other reasons.

Potential Harms Associated with Preventive Interventions

Both SIGN and USPSTF acknowledge similar potential harms associated with certain preventive strategies. For instance, both groups acknowledge that use of sunscreen can lead to a false sense of security, which might lead to individuals

spending more time in the sun thereby increasing their risk for skin cancer. Both groups also note that there are concerns about the use of sunscreens with SPF of 15 or higher and/or sun avoidance measures which may lead to the potential for vitamin D deficiency. USPSTF further notes the possible impact of avoiding sun exposure as a factor contributing to reduced physical activity, particularly in children.

Primary Prevention

Both groups are in general agreement that "indirect evidence" supports the use of preventive interventions, such as avoidance and other sun-protective measures in reducing the risk of melanoma. There are some differences however, in the interventions that they consider (see below).

Areas of Differences

Preventive Counseling/Education

There are some differences between the two groups with respect to preventive counseling and education. While the USPSTF notes that community and worksite educational interventions have demonstrated significantly increased use of skin protection measures, they find that there is insufficient evidence to recommend for or against routine counseling by primary care clinicians to prevent skin cancer. SIGN on the other hand recommends that brochures and leaflets be used to deliver preventive information on melanoma to the general public. They further note that individuals identified as being at higher risk should be advised about appropriate methods of sun protection and educated about the diagnostic features of cutaneous melanoma.

Primary Prevention and Interventions to Prevent Skin Cancer

SIGN regards physical protective measures as the most important preventive intervention, noting that use of sunscreen as a preventive measure may lead to a false sense of security and an increase in the amount of time spent in the sun. SIGN also notes that while most sunscreens reduce UVB exposure (thus reducing the risk of sunburn), they have little impact on UVA exposure, and that ingredients in some sunscreens may be carcinogenic.

USPSTF notes that avoiding direct sunlight is the most effective measure for reducing exposure to UV light but that there are no randomized trials of sun avoidance to prevent skin cancer. USPSTF also notes that observational studies suggest that intermittent or intense sun exposure is a greater risk factor for skin cancer than chronic exposure, supporting the hypothesis that prevention of sunburn (particularly in childhood) may reduce lifetime risk for melanoma. USPSTF further notes that using sunscreen has been shown to prevent squamous cell skin cancer, but that evidence supporting its use in preventing melanoma is mixed. Like SIGN however, USPSTF adds that people who use sunscreen alone may increase their risk for melanoma if they increase the time they spend in the sun.

Skin Self-Examination

Although SIGN found insufficient evidence to recommend for or against routine screening by health care professionals of individuals at higher risk of melanoma, they note that interventions to promote the awareness of risk factors and skin self awareness are warranted, supporting a recommendation for self examination by individuals at high risk. The USPSTF cited the existence of a single case-control study of skin self-examination as supporting a lower risk of melanoma but they note that these results are not definitive and no recommendations are made either way regarding this practice.

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